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| 10/533,893 | 05/05/2005 | Takeshi Masuda | 4034-79 | 8033 |

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| DZIERZYNSKI, EVAN P | |
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| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| **Office Action Summary** | Application No. 10/533,893 | Applicant(s) MASUDA, TAKESHI | |
|---|---|---|---|
| | Examiner Evan Dzierzynski | Art Unit 2875 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on 12/1/2006.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) 1-34 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-34 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 05 May 2005 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 12, and 26-31 rejected under 35 U.S.C. 103(a) as being unpatentable over Mamiya et al. (US Pat 5764322) in view of Allen et al. (US Pat 6829071).

As for claim 1, Mamiya et al. discloses a light source 114, a light guide element 1, 120 including an incidence surface (adjacent numeral 1) for receiving light emitting from the light source and an outgoing surface (Fig 8) from which the light incident from the incidence surface goes out; wherein, the light guide element includes a polarization selection layer 1 for causing light of a specific polarization direction, among the light incident from the incident surface, to selectively go out from the outgoing surface, and a polarization conversion layer 120 for converting light of a polarization direction, different from the specific polarization direction, into the light of the specific polarization direction;

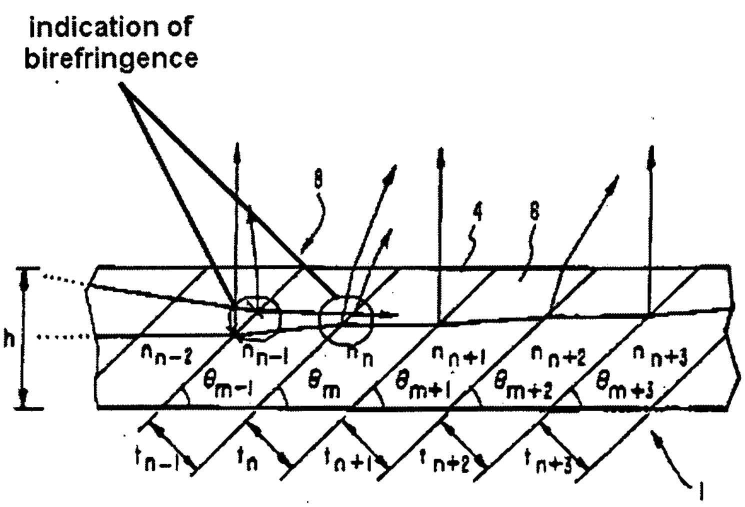
Mamiya fails to teach or disclose that at least part of the polarization conversion layer is substantially parallel to the polarization selection layer.

Allen et al. discloses a polarization conversion layer 230 that has at least a part 234 that is substantially parallel to a polarization selection layer 220, and shows that the device reflects light of the specific polarization direction substantially only toward the

outgoing surface. It would have been obvious for one of ordinary skill in the art to combine the polarization selection layer of Allen et al. with the device of Mamiya in order to provide an improved means of converting the light to another polarization direction. One would have been motivated to make this combination to improve the lighting device.

As for claim 2, Mamiya et al. further discloses wherein the polarization selection layer includes a plurality of inclining dielectric films 4, 6 provided at a predetermined angle with respect to the outgoing surface (Fig 8).

As for claim 12, Mamiya et al. teaches that the polarization conversion layer 120 is formed of a transparent material having birefringence (as indicated below in Fig 2).




As for claim 26, Mamiya further teaches that the polarization conversion layer is located oppositely to the outgoing surface with the polarization selection layer interposed therebetween (Fig 8).

As for claim 27, Mamiya further discloses that the polarization conversion layer is located closer to the outgoing surface than the polarization selection layer (Fig 8).

As for claim 28, Mamiya further teaches a display panel 120 provided on the outgoing surface side of the light guide element of the illumination device and including at least one polarizer (116, Fig 8).

As for claim 29, Mamiya teaches wherein the illumination device further includes a transparent input device 126 formed on the counter surface of the light guide element.

As for claim 30, Mamiya teaches that the display panel includes a substrate 100, and the light guide element included in the illumination device acts as the substrate (Fig 8).

As for claim 31, Mamiya et al. discloses a light source 114, a light guide element 1 including an incidence surface (adjacent numeral 1) for receiving light emitting from the light source and an outgoing surface (Fig 8) from which the light incident from the incidence surface goes out; wherein, the light guide element includes a polarization selection layer 1 for causing light of a specific polarization direction, among the light incident from the incident surface, to selectively go out from the outgoing surface, and a polarization conversion layer 120 for converting light of a polarization direction, different from the specific polarization direction, into the light of the specific polarization direction.

Mamiya fails to teach or disclose that at least part of the polarization conversion layer is substantially parallel to the polarization selection layer.

Allen et al. discloses a polarization conversion layer 230 that has at least a part 234 that is substantially parallel to a polarization selection layer 220, and shows that the device reflects light of the specific polarization direction substantially only toward the outgoing surface (Fig 2). It would have been obvious for one of ordinary skill in the art

to combine the polarization selection layer of Allen et al. with the device of Mamiya in order to provide an improved means of converting the light to another polarization direction. One would have been motivated to make this combination to improve the lighting device.

Claims 3-5 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mamiya et al. in view of Allen et al. (US Pat 6829071) and Hiyama et al. (US Pat 6104454).

As for claim 3, Mamiya et al. discloses a light source 114, a light guide element 1 including an incidence surface (adjacent numeral 1) for receiving light emitting from the light source and an outgoing surface (Fig 8) from which the light incident from the incidence surface goes out; wherein, the light guide element includes a polarization selection layer 1 for causing light of a specific polarization direction, among the light incident from the incident surface, to selectively go out from the outgoing surface, and a polarization conversion layer 124 for converting light of a polarization direction, different from the specific polarization direction, into the light of the specific polarization direction.

Mamiya fails to teach or disclose that at least part of the polarization conversion layer is substantially parallel to the polarization selection layer.

Allen et al. discloses a polarization conversion layer 230 that has at least a part 234 that is substantially parallel to a polarization selection layer 220. It would have been obvious for one of ordinary skill in the art to combine the polarization selection layer of Allen et al. with the device of Mamiya in order to provide an improved means of

converting the light to another polarization direction. One would have been motivated to make this combination to improve the lighting device.

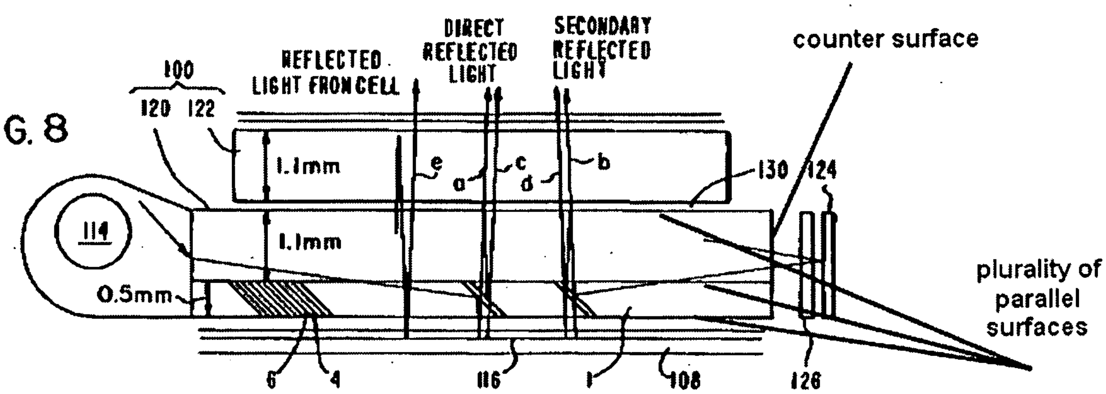
Mamiya et al. also teaches that the polarization selection layer includes a plurality of inclining dielectric films 4, 6 inclining with respect to the outgoing surface, but fails to teach that the plurality of inclining dielectric films are arranged increasingly densely as becoming farther from the incidence surface. Hiyama et al. teaches a plurality of dielectric films 231 that are arranged increasingly densely as they become farther from the incidence surface (Fig 12). It would have been obvious for one of ordinary skill in the art to combine the plurality of dielectric films that become more dense as the distance from the incidence light increases in order to achieve light with uniform intensity (col 11, ln 21-27).

As for claim 4, Mamiya further teaches that the light guide element includes a first member 1 having a main surface (bottom of 1) which includes a plurality of inclining surfaces inclining with respect to the outgoing surface (Fig 8) and a plurality of parallel surfaces generally parallel to the outgoing surface (120 and the top and bottom of 1), and a second member 130 provided on the main surface of the first member for flattening the main surface; the plurality of inclining dielectric films are respectively formed on the plurality of inclining surfaces of the main surface (col 10,ln 49+) and the plurality of parallel surfaces on the main surface are arranged increasingly sparsely as becoming further from the incidence surface (Fig 8).

As for claim 5, Mamiya et al. further teaches that the polarization selection layer includes a plurality of further dielectric films respectively formed on the plurality of parallel surfaces of the main surface (4 and 6 are provided on the bottom of 1).

As for claim 8, Mamiya et al. teaches that the light guide element further includes a counter surface (as indicated below) facing the outgoing surface, and the polarization selection layer 1 is located in the vicinity of the counter surface and closer to the counter surface than the polarization conversion layer (Fig 8).

FIG. 8




As for claim 9, Mamiya et al. teaches that the plurality of parallel surfaces are located closer to the counter surface than the plurality of inclining surfaces (as indicated above in Fig 8).

As for claim 10, Mamiya also teaches a prism sheet 112 for the device but fails to teach that it is on the main surface. It would have been obvious for one of ordinary skill in the art to make the main surface a prism sheet including a plurality of prisms in order to increase the amount of light reflected from the back of the main surface of the device.

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mamiya, Allen, and Hiyama as applied to claim 5 above, and further in view of Parker et al. (US 2002/0080598).

As for claim 6, Mamiya teaches the device as discussed above but fails to teach that the polarization selection layer is located in the vicinity of the outgoing surface and closer to the outgoing surface than the polarization conversion layer. Parker et al. teaches a polarization selection layer 7 that is located closer to the light exit surface (Fig 1, near 17) than the polarization conversion layer (BL, Fig 1). It would have been obvious for one of ordinary skill in the art to rearrange the device of Mamiya in the manner that Parker et al. has shown, since it has been held that rearranging parts of a prior art structure involves only routing skill in the art. *In re Japikse*, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950).

As for claim 7, Mamiya further teaches that the plurality of parallel surfaces (120 and bottom and top of 1) is closer to the outgoing surface than the plurality of inclining surfaces (Fig 8).

Claims 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mamiya et al., Allen, and Hiyama, as applied to claim 4 above, and further in view of Sumida et al. (US Pat 6650382).

As for claim 11, Mamiya discloses the device as discussed above, but fails to teach or disclose that the second member is a transparent resin layer formed of a transparent resin material. Sumida et al. teaches a similar device with transparent resin layer formed of a transparent resin material. It would have been obvious for one of ordinary skill in the art to combine the transparent resin layer material of Sumida et al. with the device of Mamiya in order to provide an inexpensive material for the device that is easily manufactured.

Mamiya fails to teach or disclose that at least part of the polarization conversion layer is substantially parallel to the polarization selection layer. Allen et al. discloses a polarization conversion layer 230 that has at least a part 234 that is substantially parallel to a polarization selection layer 220. It would have been obvious for one of ordinary skill in the art to combine the polarization selection layer of Allen et al. with the device of Mamiya in order to provide an improved means of converting the light to another polarization direction. One would have been motivated to make this combination to improve the lighting device.

Mamiya teaches that the polarization conversion layer has birefringence (as indicated on page 6 of the instant Office action) but fails to teach that the polarization conversion layer is an injection-molded transparent resin layer. Sumida et al. teaches a polarization conversion layer that is an injection molded transparent resin layer (col 21, ln 48+). It would have been obvious for one of ordinary skill in the art to combine the injection molded transparent resin layer of Sumida et al. with the device of Mamiya since injection molding is well known, cost effective means of producing resin material.

Claims 13, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mamiya et al. in view of Allen and Sumida et al. (US Pat 6650382).

As for claim 13, Mamiya teaches the device as discussed above but fails to teach that the polarization conversion layer is an injection molded transparent resin layer. Sumida et al. teaches a polarization conversion layer that is an injection molded transparent resin layer (col 21, ln 48+). It would have been obvious for one of ordinary skill in the art to combine the injection molded transparent resin layer of Sumida et al.

with the device of Mamiya since injection molding is well known, cost effective means of producing resin material.

As for claim 16, Mamiya et al. discloses a light source 114, a light guide element 1 including an incidence surface (adjacent numeral 1) for receiving light emitting from the light source and an outgoing surface (Fig 8) from which the light incident from the incidence surface goes out; wherein, the light guide element includes a polarization selection layer 1 for causing light of a specific polarization direction, among the light incident from the incident surface, to selectively go out from the outgoing surface, and a polarization conversion layer 120 for converting light of a polarization direction, different from the specific polarization direction, into the light of the specific polarization direction; and the polarization selection layer reflects the light of the specific polarization direction substantially only toward the outgoing surface (Fig 8).

As for claim 17, Mamiya et al. discloses a light source 114, a light guide element 1 including an incidence surface (adjacent numeral 1) for receiving light emitting from the light source and an outgoing surface (Fig 8) from which the light incident from the incidence surface goes out; wherein, the light guide element includes a polarization selection layer 1 for causing light of a specific polarization direction, among the light incident from the incident surface, to selectively go out from the outgoing surface, and a polarization conversion layer 120 for converting light of a polarization direction, different from the specific polarization direction, into the light of the specific polarization direction; and the polarization selection layer reflects the light of the specific polarization direction substantially only toward the outgoing surface (Fig 8).

Mamiya teaches that the directions of a slow axis and a fast axis of the plate in a plane parallel to the outgoing surface do not match the specific polarization direction (Fig 8).

Mamiya fails to teach or disclose that at least part of the polarization conversion layer is substantially parallel to the polarization selection layer.

Allen et al. discloses a polarization conversion layer 230 that has at least a part 234 that is substantially parallel to a polarization selection layer 220, and shows that the device reflects light of the specific polarization direction substantially only toward the outgoing surface. It would have been obvious for one of ordinary skill in the art to combine the polarization selection layer of Allen et al. with the device of Mamiya in order to provide an improved means of converting the light to another polarization direction. One would have been motivated to make this combination to improve the lighting device.

Mamiya fails to specify that the polarization conversion layer is a phase plate made from an injection molded transparent resin layer. Sumida et al. teaches a polarization conversion layer that is an injection molded transparent resin layer (col 21, ln 48+). It would have been obvious for one of ordinary skill in the art to combine the injection molded transparent resin layer of Sumida et al. with the device of Mamiya since injection molding is well known, cost effective means of producing resin material.

Claims 14, 15, and 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mamiya and Allen, as applied to claim 12 above, and further in view of Cornelissen et al. (US Pat 6329968).

As for claim 14, Mamiya teaches the device as discussed above but fails to teach it with a phase plate. Cornelissen et al. further teaches that the polarization conversion layer is a phase plate 21. It would have been obvious for one of ordinary skill in the art to combine the phase plate of Cornelissen et al. with the device of Mamiya in order to provide a plate that prevents the loss of light (col 5, ln 22+).

As for claim 15, Mamiya teaches that the directions of a slow axis and a fast axis of the phase plate in a plane parallel to the outgoing surface do not match the specific polarization direction (Fig 8).

As for claim 18, Mamiya further teaches that the phase plate has monoaxial refractive index anisotropy (Fig 2).

As for claims 19-22, given the structure of Mamiya et al. it is inherent that the device of Mamiya et al. is able to fulfill the claimed limitations of the polarization of the phase plate, since light from the light source is being refracted and reflected at all angles, therefore the angles of the polarized light are within the claimed ranges.

Claims 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mamiya, Allen, and Cornelissen et al., as applied to claim 15 above, and further in view of Wortman et al. (US Pat 6101032).

As for claim 23, Mamiya teaches the device as discussed above but fails to teach it with a biaxial refractive index anisotropy. Wortman et al. teaches a phase plate with a biaxial refractive index anisotropy (col 10, ln 44+). It would have been obvious for one of ordinary skill in the art to combine the plate of Wortman et al. that has biaxial

refractive index anisotropy with the device of Mamiya in order to provide the device with a plate that more effectively refracts the light rays.

As for claims 24 and 25, given the structure of Mamiya et al. it is inherent that the device of Mamiya et al. is able to fulfill the claimed limitations of the polarization of the phase plate, since light from the light source is being refracted and reflected at all angles, therefore the angles of the polarized light are within the claimed ranges.

Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mamiya in view of Hiyama.

As for claim 32, Mamiya et al. discloses a light source 114, a light guide element 1 including an incidence surface (adjacent numeral 1) for receiving light emitting from the light source and an outgoing surface (Fig 8) from which the light incident from the incidence surface goes out; wherein, the light guide element includes a polarization selection layer 1 for causing light of a specific polarization direction, among the light incident from the incident surface, to selectively go out from the outgoing surface, and a polarization conversion layer 120 for converting light of a polarization direction, different from the specific polarization direction, into the light of the specific polarization direction;

Mamiya et al. also teaches that the polarization selection layer includes a plurality of inclining dielectric films 4, 6 inclining with respect to the outgoing surface, but fails to teach that the plurality of inclining dielectric films are arranged increasingly densely as becoming farther from the incidence surface. Hiyama et al. teaches a plurality of dielectric films 231 that are arranged increasingly densely as they become farther from the incidence surface (Fig 12). It would have been obvious for one of

ordinary skill in the art to combine the plurality of dielectric films that become more dense as the distance from the incidence light increases in order to achieve light with uniform intensity (col 11, ln 21-27).

Claims 33, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mamiya in view of Sumida et al.

As for claim 33, Mamiya et al. discloses a light source 114, a light guide element 1 including an incidence surface (adjacent numeral 1) for receiving light emitting from the light source and an outgoing surface (Fig 8) from which the light incident from the incidence surface goes out; wherein, the light guide element includes a polarization selection layer 1 for causing light of a specific polarization direction, among the light incident from the incident surface, to selectively go out from the outgoing surface, and a polarization conversion layer 120 for converting light of a polarization direction, different from the specific polarization direction, into the light of the specific polarization direction; and the polarization selection layer reflects the light of the specific polarization direction substantially only toward the outgoing surface (Fig 8).

Mamiya teaches that the polarization conversion layer has birefringence (as indicated on page 6 of the instant Office action) but fails to teach that the polarization conversion layer is an injection-molded transparent resin layer. Sumida et al. teaches a polarization conversion layer that is an injection molded transparent resin layer (col 21, ln 48+). It would have been obvious for one of ordinary skill in the art to combine the injection molded transparent resin layer of Sumida et al. with the device of Mamiya since injection molding is well known, cost effective means of producing resin material.

As for claim 34, Mamiya et al. discloses a light source 114, a light guide element 1 including an incidence surface (adjacent numeral 1) for receiving light emitting from the light source and an outgoing surface (Fig 8) from which the light incident from the incidence surface goes out; wherein, the light guide element includes a polarization selection layer 1 for causing light of a specific polarization direction, among the light incident from the incident surface, to selectively go out from the outgoing surface, and a polarization conversion layer 120 for converting light of a polarization direction, different from the specific polarization direction, into the light of the specific polarization direction; and the polarization selection layer reflects the light of the specific polarization direction substantially only toward the outgoing surface (Fig 8).

Mamiya teaches that the directions of a slow axis and a fast axis of the plate in a plane parallel to the outgoing surface do not match the specific polarization direction (Fig 8).

Mamiya fails to specify that the polarization conversion layer is a phase plate made from an injection molded transparent resin layer. Sumida et al. teaches a polarization conversion layer that is an injection molded transparent resin layer (col 21, ln 48+). It would have been obvious for one of ordinary skill in the art to combine the injection molded transparent resin layer of Sumida et al. with the device of Mamiya since injection molding is well known, cost effective means of producing resin material.

***Response to Arguments***

Applicant's arguments with respect to claims 1, 3, 16, 17, and 31 have been considered but are moot in view of the new ground(s) of rejection required by the amendments to the claims filed 12/01/2006.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Evan Dzierzynski whose telephone number is (571)-272-2336. The examiner can normally be reached on Monday through Friday 7:00 am - 3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Renee Luebke can be reached on M-F (571)-272-2009. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

EPD

2/26/2007

RENEE LUEBKE
PRIMARY EXAMINER